RPM 2011-12 End-of-Year Report

(and Summer Institute 2012 Preparation)

**Due Date: July 11, 2012**

This year’s end-of-year RPM report is essentially an “end-of-grant” reflection report as well; it will provide important documentation for our summative report for the overall project and will also serve a secondary role as a useful preparation process for the Summer Institute. While clearly one person will need to take the lead on assembling and synthesizing what goes into the final submission, we hope that rather than something written entirely by a single person in isolation, the report will reflect contributions from the core college team involved in the RPM work, and if possible include perspectives even from faculty who may have only been marginally involved (and who may have questions or concerns about the work) in order to surface critical themes/ideas in the areas below.

**Section 1: Reflections on the Project Overall**

For each of the subsections A to D below, address both the major successes you’ve had in the work to date as well as any significant challenges you’ve encountered with respect to the particular aspect of the work being described.

1. **Summarize briefly the specific “structural” changes (e.g., changes in course content, number of courses offered, placement approaches, etc.) you implemented in your developmental math program (or in specific courses) as part of your college’s involvement in the Re-Thinking Precollege Math project.**

To aid readability, a bulleted list is provided:

* Fully implemented a new precollege curriculum that makes it possible for most students needing precollege math courses to complete their college math course within one year. (Our data already shows a higher percentage of students are accomplishing this.) The new curriculum places many of the technical topics used almost exclusively by STEM students, such as simplifying and solving rational and radical expressions and equations, into a precollege course (Math 98) only taken by students needing precalculus. The two courses in the main sequence (Math 81 & 91) start with basic signed numbers and fractions and take an early functions approach. In addition, these two courses have students applying mathematics in meaningful contexts and examining their own habits and attitudes related to learning.
* Required faculty to use common assessments and submit their results for analysis. This began with common mastery exams on key topics which students must pass at an 80% level to be eligible for passing the course. It has recently expanded to the inclusion of a small set of common questions as part of each instructor’s final exam. Though the use of common final exam questions is not mandatory, most instructors voluntarily participate.
* Established “lead instructors” for courses. These instructors support other faculty by answering questions about, providing models for, and facilitating discussion of teaching and assessment in specific classes. They also encourage consistency across sections by reviewing syllabi and overseeing the administration of and reporting about common assessments. This has produced a team approach and sense of shared responsibility around the developmental math courses.
* Assigned faculty to courses on an annual basis, rather than quarterly. By doing this for full-time faculty, it became possible to essentially guarantee adjunct faculty specific courses and levels of employment. Adjunct instructors reported an increased willingness to invest time and energy into examining and improving their pedagogy since they know they will have an opportunity to use the results.
* Began revising our procedures for placing students into courses. This was not explicitly part of (or funded through) the RPM grant, but has received increased attention as a result of our RPM activities. The nontraditional arrangement of content increased the need for a more customizable alternative to our COMPASS placement test and led to conversations with local school districts about improving our policies for placement using high school transcripts.

1. **Reflect on the role that your institutional and departmental context (e.g., leadership issues, department-wide policies and decision-making, use of and support for part-time faculty, where the precollege math program is housed, whether the college administration is visibly and effectively supportive of innovations in pre-college programs, etc.) played in shaping the work you did in RPM and influencing the progress you’ve made in your project. In what ways have you specifically taken these contextual factors into consideration in addressing your work in the RPM project?**

The following list summarizes features of Highline Community College that affected our work in the RPM project. Subsequent paragraphs provide details about how these features influenced our work.

* Precollege mathematics is housed within the mathematics department.
* Tenured mathematics instructors frequently teach precollege courses, and many of those instructors also teach courses in the middle and upper end of the full math sequence.
* Several members of the math department have been involved in curricular reforms at the local, state, and national levels for five years or more.
* Faculty members have traditionally had considerable autonomy. Innovation is encouraged, and consistency at each course level is not rigidly monitored, but rather assumed as the result of using a common textbook and using a common set of learning outcomes.
* The math department utilizes subcommittees to oversee different portions of the math curriculum (developmental, college-level general education, introductory STEM, and advanced STEM). These subcommittees inform and solicit feedback from the entire department, but generally have authority to specify learning outcomes, assessments, and materials.
* The number of full-time faculty and adjunct faculty are comparable (usually 1 – 2 adjunct instructors per full-time instructor).
* The department and college (through the faculty union in particular) make an effort to engage adjunct instructors in discussions and decision-making as well as acknowledge their contributions.
* Faculty members serve as department coordinators and division chairs, which are administrative roles.
* Highline’s administrators (Deans, VPs, etc.) have for many years encouraged and supported the mathematics department’s efforts to improve student success.
* Our RPM work began as the college was finishing an *Achieving the Dream* grant focused on using data-driven decision-making to improve the achievement of groups of students who struggled to complete college level math and writing at the same rate as some of their peers.

The effects of these features are described below.

***Creating a New Curriculum***

Our successful design and adoption of the new curriculum drew on many of the items listed above. Since the mathematics faculty controlled the content and teaching of precollege courses, we had very few administrative barriers to making changes. Given that nearly everyone had taught these classes, there was already agreement that change was needed. We were able to build on the curricular and pedagogical work several Highline instructors had previously completed: these include Helen Burn’s alternative algebra course; Erik Scott’s involvement in outcome development as part of the *Transition Mathematics Project*; Amy Ehrlich, Barbara Hunter, and Diana Lee’s creation of a “best practices” guide for precollege instruction, and Aaron Warnock’s considerable knowledge of electronic software like ANGEL and MyMathLab. The fact that Helen, Erik, Diana, and Aaron have also served as department coordinators and Helen was recently chair of the Pure & Applied Science Division also ensured the team leading reform efforts had considerable awareness of the relevant political and logistical issues.

The department’s use of subcommittees for monitoring and revising portions of the curriculum allowed the math faculty members who had the greatest interest in the precollege curriculum to lead the change. The group overseeing the precollege courses – the “DevMath group” – is currently composed of Barbara Hunter, Diana Lee, Erik Scott, and Aaron Warnock. These four people have been the core of this group for the past six years, have met 1 – 4 times per month, and ultimately have decision-making authority for all curricular matters related to developmental math. They made adjustments to the curriculum, implemented common final questions, organized the course lead model, and served to support part-time faculty. In short, the group is nearly wholly responsible for the success of our project.

It is also important to note that the DevMath group is a diverse mix of departmental members. The importance of this diversity cannot be overstated, because it enables the group to communicate effectively with the different subgroups (formed around friendship alliances, philosophical orientation, or even office proximity) commonly found in large departments. At Highline, this has led to a high degree of trust between the DevMath group and the rest of the department, making it possible for large-scale change to take place.

***Implementing the Curriculum***

When implementing our new curriculum, we benefitted from other aspects of our college culture and policies. The support of our Vice President of Academic Affairs, Jeff Wagnitz, and Dean of Instruction, Rolita Ezeonu, helped us prepare the rest of the college for the change. They also approved our use of funds from various grants to reduce the teaching loads of key faculty members and to offer stipends to adjunct faculty. Jeff also played a significant role as co-chair of the JAOG committee that is dealing with the intermediate algebra requirement in the DTA. His guidance of that discussion helped limit the danger that courses affected by our new curriculum would limit students’ ability to transfer to other institutions.

Within our department, success came from continually nurturing the trust between instructors. The DevMath group respected the culture of autonomy by allowing faculty to avoid teaching the redesigned courses. Since we have a low adjunct-to-full time faculty ratio, we were able to have all of our adjunct faculty meet or converse with the DevMath group and other “early adopter” full-time faculty. The result was greater engagement of adjunct faculty as collaborators who were invested in the success and evolution of our program rather than as drones who were simply expected to perform in a new way.

***Evaluating the Curriculum***

Our participation in *Achieving the Dream* led both the college and math department to emphasize making decisions using data. This provided persuasive evidence of the need for change, and data showing positive changes in pass rates and college math course completion helped minimize faculty resistance to the change. By emphasizing the use of data campus-wide, Highline’s administrators made it easier for the DevMath group to get buy-in from instructors about providing data on their individual courses for analysis. Though our administration gave us considerable access to Highline’s Institutional Researcher, Tonya Benton, we were even more fortunate to have Helen Burn in our department. Helen’s doctoral work provided her with training in institutional research, and effectively provided our project with an in-house analyst. This made it possible for us to identify, analyze, and report useful data rapidly enough to influence decision-making on a regular basis.

1. **The RPM project as a whole made an effort to promote and support faculty efforts to a) explore different concrete classroom practices and strategies around teaching and assessment and b) inquire collectively about the results of those efforts. To what extent and in what ways have any changes in instructional practices and collaborative inquiry occurred in the precollege math program at your college as part of your RPM project?**

During our participation in this project, we have seen two changes which suggest a significant shift is taking place in our departmental culture. First, the use of common assessments has become commonplace throughout our department, even among faculty who have not participated in our precollege redesign. This may be a product of both the college’s focus on using data in program assessment and continual reports from the DevMath group about collaborative activities (like Faculty Inquiry Groups) and the results of common assessments. Second, a larger number of faculty are participating in inquiry focused on student understanding or how their pedagogy affects student understanding and behaviors. Once again, we are seeing this happen spontaneously in a few cases involving adjunct faculty or full-time faculty who were not involved in the redesign.

Though we have not seen widespread adoption of the specific techniques – CATs, classroom exchanges, FIGs emphasizing student products, etc. – presented and tried during the grant, aspects of them appear more frequently in conversations within the department. For example, when an instructor expresses uncertainty about what his/her students understand, someone else will often suggest using a formative assessment strategy that is essentially a CAT. Our experiences with classroom exchanges have helped a number of faculty recognize that being observed by a peer can be done for reasons other than evaluation, and we can offer some protocols rather than expect each person to “reinvent the wheel.” Multiple quarters of FIGs have ultimately included a majority of both adjunct and full-time faculty, all of whom now have experience formulating and investigating questions about their teaching and student learning.

1. **How, if at all, have any of the activities you’ve done in your precollege math program as part of the RPM project incorporated a focus on student attributes and perspectives as math learners?**

Our involvement in the RPM project allowed us to continue our prior work on the student attributes. We had already incorporated student attributes into the learning outcomes for each of the developmental mathematics courses, so the CATs and FIGs provided tools for examining how students understood or developed the attributes. Conversations in and outside the FIGs reveal significant variation in the degree to which faculty see attribute development as something they must teach explicitly versus simply being a consequence of the other requirements of the course. Many faculty teaching Math 81 have adopted Diana Lee’s “structured notebook” system for helping students take greater responsibility for their own learning by reflecting on their habits and overall class performance. Apart from this technique, there do not appear to be other methods many instructors use to “teach” to the attributes, and it is clear that more work is needed for our department to reach consensus on what it means for a student to have truly developed an attribute, as well as to identify a variety of strategies that routinely help a majority of students achieve that goal.

**Section 2: Sustainability and Next Steps**

1. **What aspects of the changes in your precollege math program initiated and/or support by the work of the RPM project do you foresee being sustained at your college beyond December 2012 without the infusion of any new external grant support?**

We anticipate all elements mentioned in Section 1A moving ahead. It is likely that the grant evaluation will trickle—that is, we will cease doing student satisfaction surveys. But we foresee needing to continue to monitor success rates; and our work with common assessments/common final questions will continue along with our placement process initiatives.

1. **If new grant resources (comparable to the RPM level of funding at a minimum) were available, what specific activities would you want to extend or initiate to continue your efforts to address improving student progress and success in your precollege math program?**

*Funding for spinoffs*

The curricular redesign is complete. The curriculum heavily relies on the MyMathLab technology. As a result, several projects have emerged that can leverage this technology by easily reconfiguring the curriculum. For example, in developing the Veterans Math Bootcamp, Helen Burn combined all three courses (M81, 91, and 98) into a single, multi-level classroom that uses the Emporium Model. Another example is the Gateway to College program which used a similar idea – to give students access to Math 81 and 91. We foresee other projects emerging where the curriculum can be reconfigured.

*Funding for professional development*

The student learning experiences have changed under the redesign in part because of the use of MyMathLab but also because of the increased emphasis on application. That said, increased application is not synonymous with increased perceptions of relevance or student engagement. During year one of the grant, Diana Lee visited classrooms to look for student engagement, and we did have discussions about bolstering student engagement. However, classroom observations by RPM grant leadership suggest that the daily classroom experience may not have changed much and is still dominated by lecture. As well, on satisfaction surveys, a large proportion of students indicate wanting to interact more with their peers during class, and there is still room to grow with respecting to building students’ perception of relevance. We foresee the need to develop a more complete professional development experience for new and existing faculty. What form this will take is still not certain, but the effort would be bolstered by additional funding.